REMARKS/ARGUMENTS

The Examiner rejected claims 1-6, 10-12, and 47-51 based on newly cited art, U.S. Patent No. 4,193,691 of Fjarlie ("Fjarlie"). Specifically, the Examiner rejected claims 1-4, 12 and 47-51 under 35 U.S.C. §103(a), as being unpatentable over Fjarlie in view of U.S. Patent No. 6,128,078 of Fateley ("Fateley"), previously cited; claims 5, 6, and 10 under §103(a), as being unpatentable over Fjarlie in view of Fateley and U.S. Patent No. 6,504,943 of Sweatt et al., previously cited; and claim 11 was rejected under §103(a) as being unpatentable over Fjarlie in view of Fateley and U.S. Patent No. 5,061,049 of Hornbeck, previously cited. Claims 23-46 remain allowed, and claims 7-9 and 13-22 were objected to only as dependent from a rejected base claim. For the reasons stated below, Applicants assert that the foregoing rejected claims are allowable over the prior art of record, and that therefore all of claims 1-51 are allowable in their present form.

As discussed more fully and completely below, none of the prior art references or combinations suggested by the Examiner teaches an optical apparatus or method including all of the elements of Applicants' claimed inventions. Particularly, none of the prior art teaches an optical method or apparatus, which uses an array of **individually controllable** micromirrors to introduce dither modulation signals into **distinct spectral channels**, as recited in independent claims 1 and 47. Therefore, none of the prior art can anticipate nor render obvious any of the rejected claims.

As discussed in the previous response, which is incorporated herein by reference, none of Fateley, Sweat, Hornbeck or the combinations proposed by the Examiner teaches an apparatus or method that uses an array of micromirrors that are individually pivoted to introduce distinct dither modulation signals into unique spectral channels.

In the present action, the Examiner has introduced Fjarlie, suggesting that it discloses an apparatus within array of beam-modulating elements that are individually controllable to carry dither modulation type signals. The Examiner has combined Fjarlie with the previously cited patents as noted above. Applicants respectfully disagree with the Examiner's analysis. Particularly, as discussed below, Fjarlie does **not** teach introducing dither modulations on a channel by channel (e.g., slit by slit) basis, but rather modulates groups of elements or slits together. Therefore, the proposed combinations cannot render obvious any of the pending claims.

Fjarlie discloses a spectrometer invention. In one embodiment, the spectrometer includes a slit assembly 12 having an array of slits 20a, b, c ... n. (Fjarlie at col. 1, line 48 – col. 2, line 15). Each of the slits 20a-n in the array may be actuated on or off by use of means 24. (Fjarlie at col. 2, lines 42-45). A group or pattern or slits may be turned on together to measure a particular spectrum or interest. (Fjarlie at col. 2, lines 42-50). Particularly, the specific pattern of slits will be selected based on the particular spectral lines which are characteristic of the substance under test. (Id.) In another embodiment, Fjarlie teaches that several different **groups of slits** may be multiplexed using different frequencies f1-fn, in order to investigate a plurality of molecules simultaneously. However, unlike the claimed invention, the frequency division multiplexing is not **individually** applied on an element by element (or slit by slit) basis. Rather, entire **groups or sets of slits** are modulated together – each group representing a particular pattern corresponding to a substance under test. The selected **"groups of slits** are identified by the addition of a frequency f1, f2, ..., fn." (Fjarlie at col. 4, lines 10-12)(emphasis added).

As shown in Figure 3 and described in the specification, gates 40a-40n are used to address different arrays or "**combinations**" of slits. (Fjarlie at col. 4, lines 25-53). Certain inputs to module 42 are pre-programmed to be energized up a receipt of a signal from gate 40a. (Fjarlie at col. 4, lines 46-48). A second "predetermined array" of outputs is energized upon

receipt of upon receipt of a signal from gate 40b, and so on through gate 40n. (Fjarlie at col. 4, lines 48-50). Thus, whenever a signal appears on one of selected gates 40a-40n "**a corresponding selected combination of slits are energized**". (Fjarlie at col. 4, lines 50-53)(emphasis added). This allows Fjarlie to select different groups of slits to energize and modulate at different times to investigate different substances of interest. More specifically, Fjarlie explains that by "**driving one set of slits at a first frequency and another set of slits at another frequency** ... it is possible to investigate two or more molecules in a material under investigation at the same time." (Fjarlie at col. 6, lines 26-31)(emphasis added).

Thus, like the prior art of reference, Fjarlie does not teach an apparatus that includes an array of beam manipulating elements that are individually controllable to introduce distinct dither modulation signals into unique spectral channels. Instead, Fjarlie teaches introducing frequency modulation signals into entire groups of slits corresponding to a particular spectrum of interest. As a result, **individual spectral channels** in Fjarlie cannot be distinguished from one another by detecting the modulation signals. Rather, the modulation signals can only be used to generally indicate the group or set in which the spectral channel resides.

In contrast, Applicants optical apparatus allows distinct dither modulation signals to be introduced into **each spectral channel**. This advantageously allows each specific spectral channel to be **individually detected** solely based on its dither modulation signal. Applicants describe these advantages, for example, on page 19 of the pending application:

> 1. The optical spectral monitoring apparatus **100** thus is capable of introducing distinct dither modulation signals in multiple spectral channels in a frequency-division-multiplexed fashion. **The distinct dither modulation signals enable the multiplexed spectral channels to be individually detected (e.g., by way of synchronous detection), whereby an optical power spectrum of the spectral channels can be derived. Such dither modulation signals may also be used as "identification markers" (or frequency tags) for identifying individual spectral channels in an optical networking application.** (Emphasis added).

Fjarlie alone and in combination with the others prior art references fail to disclose an optical apparatus including micromirrors that are individually pivotable such that distinct dither modulation signals may be carried in each spectral channel. Since this element of claim 1 is completely missing from Fjarlie and all the prior art of reference, claim 1 and all claims that depend from claim 1 (e.g., claims 1 – 6, 10-13 and 18 – 20) are patentable over Fjarlie and all other cited references.

Claim 47 recites a method of spectral modulating and monitoring using a frequency-division-multiplexing scheme. Like claim 1, claim 47 requires that the micromirrors that are individually pivotable such that the spectral channels carry **distinct** modulation signals. As set forth above, Fjarlie and the other prior art references do not disclose or suggest introducing distinct modulation signals into each spectral channel. This is significantly different from Applicants' claimed invention, which allows each spectral channel to be individually identified based on its dither modulation signal. For at least these reasons, claim 47 and all claims depending from claim 47 (e.g., claims 48 – 51) are allowable over Fjarlie and the other prior art references.

CONCLUSIONS

Applicants' inventions are both novel and nonobvious over the prior art for the reasons set forth above. None of the prior art of record, either alone or in combination, teaches each and every element of Applicants' claimed inventions.

For all of these reasons, Applicants respectfully assert that all of claims 1-51 are in condition for allowance. The Examiner's early reconsideration is respectfully requested. If the Examiner has any questions, the Examiner is invited to contact Applicants' attorney at the following address or telephone number:

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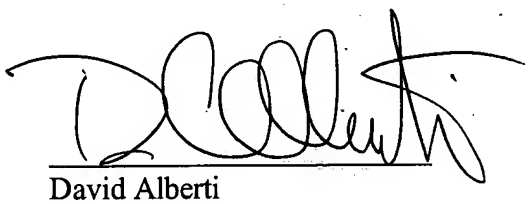
Respectfully submitted,



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